Pending Claims After Entry of Amendment
And Reply To Office Action Mailed October 22, 2001

11. (Twice Amended) An implant of titanium to be surgically implanted in living bone, comprising:

a threaded portion for engaging bone; and a

metal surface from which a native oxide layer had been substantially removed and thereafter acid etched to produce a substantially uniform array of irregularities having peak-to-valley heights not greater than about 10 microns, said acid etched surface being located on at least a part of said threaded portion.

12. An implant of claim 11, wherein substantial numbers of said irregularities are substantially cone-shaped elements.

13. An implant of claim 11, wherein said native oxide is removed by a first acid solution after which the resulting surface is etched with a second acid solution.

14. An implant of claim 13, said first acid solution is aqueous hydrofluoric acid.

15. An implant of claim 13, wherein said second acid solution is a mixture of sulfuric and hydrochloric acids.

16. An implant of claim 11, said acid etched surface being located on said threaded portion beyond the three uppermost turns of said threaded portion.

17. (Twice Amended) A dental implant having a head portion, a neck portion, and a threaded portion for contact with bone wherein said head and neck portions are provided with a smooth surface for contact with overlying gingival tissue for blocking infection, and said threaded portion has a roughened region to promoted osseointegration with bone while leaving at least one thread turn adjacent said neck portion smooth and unroughened, wherein said implant is titanium

or titanium alloy and said roughened region is created by a two-step process in which the native oxide is substantially removed by contact with a first acid solution and followed by etching of the resulting surface with a second acid solution to produce a roughened surface consisting of a substantially uniform array of irregularities having peak-to-valley heights not greater than 10μm.

18. A dental implant of claim 17, wherein said first acid solution is aqueous hydrofluoric acid.

19. A dental implant of claim 18, wherein said second acid solution is a mixture of sulfuric and hydrochloric acids.

20. A dental implant of claim 17, wherein substantial numbers of said irregularities are substantially cone-shaped elements.

21. A dental implant of claim 17, wherein up to three turns adjacent to said neck portion are left smooth and unroughened.

22. (Twice Amended) A titanium metal dental implant, comprising:

a head portion for receiving a dental restoration component;

a threaded portion for engaging bone; and

a roughened region for facilitating osseointegration with said bone and being located on a part of said threaded portion, said roughened region being uniformly acid etched after a native oxide layer had been removed to produce a substantially uniform array of irregularities having peak-to-valley heights not greater than about 10 microns; wherein said head portion includes a top surface, said roughened region beginning at a point about 3 mm below said top surface.

23. A dental implant of claim 22, wherein said roughened region is located in said threaded portion outside of the three thread turns nearest to said head portion.

24. A dental implant of claim 22, wherein said acid solution is a mixture of sulfuric and hydrochloric acids.

25. A dental implant of claim 22, wherein substantial numbers of said irregularities are substantially cone-shaped elements.

26. Cancelled.

27. (Twice Amended) A titanium implant to be surgically implanted in living bone, comprising:

a head portion having a non-round fitting; and

a threaded portion including a uniformly roughened titanium metal surface from which a native oxide layer had been substantially removed before being etched to produce a substantially uniform array of irregularities having a peak-to-valley heights ranging from about 0.3 micron to about 10 microns; wherein said head portion includes an upper flat surface, a portion of said implant between said upper flat surface and a point about 3 mm below said upper flat surface being smooth relative to said roughened threaded portion.

28. An implant of claim 27, wherein said irregularities include substantial numbers of substantially cone-shaped elements.

29. An implant of claim 28, wherein said roughened surface is an acid etched surface produced by a mixture of sulfuric and hydrochloric acids.

30. An implant of claim 27, wherein said irregularities have relatively uniform dimensions.

31. An implant of claim 27, wherein said head portion is smooth and a part of said threaded portion is smooth.

32. An implant of claim 31, wherein said roughened surface is an acid etched surface.

33. An implant of claim 32, wherein said roughened surface substantially lacks a native oxide layer.

34. Cancelled.

35. An implant of claim 27, wherein said head portion includes an upper flat surface, a portion of said implant between said upper flat surface and a third uppermost thread turn on said threaded portion being smooth.

36. An implant of claim 27, wherein said roughened surface has been subjected to grit blasting.

37. (Twice Amended) A titanium device to be surgically implanted in living bone, comprising:

a uniformly acid-etched exterior titanium metal surface from which a native oxide layer had been substantially removed and thereafter acid etched to produce a substantially uniform array of irregularities having base-to-peak heights of less than about 10 microns.

38. A titanium device of claim 37, wherein said irregularities include substantial numbers of substantially cone-shaped elements.

39. A titanium device of claim 37, wherein said exterior surface is generally cylindrical.

40. A titanium device of claim 39, wherein said exterior surface is threaded.

41. A titanium device of claim 40, wherein said device has upper and lower portions, said lower portion including said acid etched exterior surface, said upper portion being smooth.

42. A titanium device of claim 37, wherein said native oxide layer is removed through etching with a first acid solution.

43. A titanium device of claim 42, wherein said first acid solution is a HF solution.

44. A titanium device of claim 37, wherein said acid etched surface is produced by a mixture of sulfuric and hydrochloric acids.

45. A titanium device of claim 37, wherein said irregularities have relatively uniform dimensions.

46. A titanium device of claim 45, wherein said irregularities are cone-like structures.

47. (Twice Amended) A titanium device to be surgically implanted in living bone and including a uniform exterior titanium metal surface from which a native oxide layer had been substantially removed and thereafter roughened to produce a substantially uniform array of irregularities having relatively uniform dimensions and peak-to-valley heights of less than about 10 microns, substantial numbers of said irregularities being substantially cone-shaped elements; said device including a head portion with an upper flat surface, said roughened exterior surface beginning about 3 mm below said upper flat surface.

48. A titanium device of claim 47, wherein said roughened exterior surface is an acid etched surface.

49. A titanium device of claim 48, wherein said acid etched exterior surface is produced by a mixture of sulfuric and hydrochloric acids.

50. Cancelled.

51. (New) A titanium metal dental implant, comprising:

a head portion for receiving a dental restoration component;

a threaded portion for engaging bone; and

a roughened region for facilitating osseointegration with said bone and being located on a part of said threaded portion, said roughened region being uniformly acid etched

after a native oxide layer had been removed to produce a substantially uniform array of irregularities having peak-to-valley heights not greater than about 10 microns; wherein said head portion includes a top surface, said roughened region beginning at a point about 3 mm below said top surface.

52. (New) A titanium implant to be surgically implanted in living bone, comprising:

a head portion having a non-round fitting; and

a threaded portion including a uniformly roughened titanium metal surface from which a native oxide layer had been substantially removed before being etched to produce a substantially uniform array of irregularities having a peak-to-valley heights ranging from about 0.3 micron to about 10 microns; wherein said head portion includes an upper flat surface, a portion of said implant between said upper flat surface and a point about 3 mm below said upper flat surface being smooth relative to said roughened threaded portion.

53. (New) A titanium device to be surgically implanted in living bone and including a uniform exterior titanium metal surface from which a native oxide layer had been substantially removed and thereafter roughened to produce a substantially uniform array of irregularities having relatively uniform dimensions and peak-to-valley heights of less than about 10 microns, substantial numbers of said irregularities being substantially cone-shaped elements; said device including a head portion with an upper flat surface, said roughened exterior surface beginning about 3 mm below said upper flat surface.

54. (New) An implant of claim 12, wherein said substantially cone-shaped elements have a base having a diameter of about 0.3 to 1.2 microns and said bases are spaced about 0.3 to 0.75 microns from each other.

55. (New) A titanium implant of claim 28, wherein said substantially cone-shaped elements have a base having a diameter of about 0.3 to 1.2 microns and said bases are spaced about 0.3 to 0.75 microns from each other.

56. (New) A titanium device of claim 38, wherein said substantially cone-shaped elements have a base having a diameter of about 0.3 to 1.2 microns and said bases are spaced about 0.3 to 0.75 microns from each other.